

SEARCH
NOTE

IUBMB Enzyme Nomenclature

EC 5.5.1.4

Common name: inositol-3-phosphate synthase

Reaction: D-glucose 6-phosphate = 1D-*myo*-inositol 3-phosphate

Other name(s): *myo*-inositol-1-phosphate synthase; D-glucose 6-phosphate cycloaldolase; inositol 1-phosphate synthase; glucose 6-phosphate cyclase; inositol 1-phosphate synthetase; glucose-6-phosphate inositol monophosphate cycloaldolase; glucocycloaldolase

Systematic name: 1L-*myo*-inositol-1-phosphate lyase (isomerizing)

Comments: Requires NAD⁺, which dehydrogenates the -CHOH- group to -CO- at C-5 of the glucose 6-phosphate, making C-6 into an active methylene, able to condense with the -CHO at C-1. Finally, the enzyme-bound NADH reconverts C-5 into the -CHOH- form.

Links to other databases: [BRENDA](#), [EXPASY](#), [KEGG](#), [WIT](#), CAS registry number: 9032-95-5

References:

1. Eisenberg, P., Jr. D-*myo*-Inositol 1-phosphate as product of cyclization of glucose 6-phosphate and substrate for a specific phosphatase in rat testis. *J. Biol. Chem.* 242 (1967) 1375-1382. [Medline UI: [67135042](#)]
2. Sherman, W.R., Stewart, M.A. and Zinbo, M. Mass spectrometric study on the mechanism of D-glucose 6-phosphate-L-*myo*-inositol 1-phosphate cyclase. *J. Biol. Chem.* 244 (1969) 5703-5708. [Medline UI: [70027328](#)]
3. Barnett, J.E.G. and Corina, D.L. The mechanism of glucose 6-phosphate-D-*myo*-inositol 1-phosphate cyclase of rat testis. The involvement of hydrogen atoms. *Biochem. J.* 108 (1968) 125-129. [Medline UI: [68310248](#)]
4. Barnett, J.E.G., Rasheed, A. and Corina, D.L. Partial reactions of glucose 6-phosphate-1L-*myo*-inositol 1-phosphate cyclase. *Biochem. J.* 131 (1973) 21-30. [Medline UI: [73228139](#)]

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SEARCH NOTE

IUBMB Enzyme Nomenclature

EC 1.1.1.18

Common name: inositol 2-dehydrogenase

Reaction: *myo*-inositol + NAD⁺ = 2,4,6/3,5-pentahydroxycyclohexanone + NADH + H⁺

Other name(s): *myo*-inositol 2-dehydrogenase; *myo*-inositol:NAD⁺ oxidoreductase; inositol dehydrogenase; *myo*-inositol dehydrogenase

Systematic name: *myo*-inositol:NAD⁺ 2-oxidoreductase

Links to other databases: [BRENDA](#), [EXPASY](#), [GTD](#), [KEGG](#), [WIT](#), CAS registry number: 9028-25-5

References:

1. Berman, T. and Magasanik, B. The pathway of *myo*-inositol degradation in *Aerobacter aerogenes*. Dehydrogenation and dehydration. *J. Biol. Chem.* 241 (1966) 800-806. [Medline UI: [66093120](#)]
2. Larner, J., Jackson, W.T., Graves, D.J. and Stamner, J.R. Inositol dehydrogenase from *Aerobacter aerogenes*. *Arch. Biochem. Biophys.* 60 (1956) 352-363.
3. Vidal-Lieria, M. and van Uden, N. Inositol dehydrogenase from the yeast *Cryptococcus melibiosum*. *Biochim. Biophys. Acta* 293 (1973) 295-303. [Medline UI: [73200109](#)]

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